attempted to make out the arrangement of the different parts of the reproductive system. In specimens killed in osinic acid two small masses staining deeply with the acid are usually very prominent, one on each side, a little behind the posterior sucker.

As the *Cercariæ* on leaving the sporocyst may readily escape from the cockle and swim freely in the sea-water, it may thus reach a great variety of animals, and in the meantime I am unable to offer any suggestion as to the host in which the adult fluke is likely to be found.

EXPLANATION OF PLATE XIX

Cercaria pectinata.

Fig. 1. Sporocyst containing *Cercariæ* (× about 10).
Fig. 2. *Cercaria pectinata* (× 60).
Fig. 3. *Cercaria pectinata*: one of the "setæ" from the tail (highly magnified).

ART. XXVII.—*Notes on Fruit-flies, with a Description of a New Species* (Dacus xanthodes).

By Captain T. BROUN, F.E.S., Government Entomologist and Fruit Inspector at Auckland.

[*Read before the Auckland Institute, 27th February,* 1904.]

THESE two-winged flies are, without doubt, the most dreaded of all orchard pests, and consequently strenuous efforts are made to prevent their establishment in New Zealand. The most important species from our point of view are the Mediterranean fly (*Halterophora capitata*) and the Queensland one (*Tephritis tryoni*).

The Mediterranean species is known to occur in widely distant countries, including Malta, Sicily, Azores, Madeira, Cape Verde Islands, Bermuda, Cape Colony, Mauritius, Cuba, and Australia. European records of its ravages extend as far back as the year 1826, when it was stated that "fully a third of the oranges shipped to London from the Azores were rendered unfit for use before they reached their destination through the presence of this maggot before they were packed." In 1890 an article appeared in the American publication called "Insect Life" wherein this fly was described as a peach-pest at Bermuda. During 1892 Mr. J. H. Cooke stated that "all the oranges in Malta had been destroyed for the past few years by the maggot of this fly." The opinions of competent observers and responsible officials only have been quoted here. Besides the fruits already mentioned, about fifteen others have been attacked.

The Queensland fly was, I believe, first recognised in that colony in 1887, but it was not described until 1897, the date of the report prepared by Mr. W. W. Froggatt for the Government of New South Wales. This insect in Australia does not appear to breed further south than Newcastle, New South Wales—about our 33rd parallel of latitude; but it has been plentifully found here in fruit imported from the tropical islands situated north-east of New Zealand.

Before proceeding further it may be stated that, relying solely on the results of the inspection of fruit landed at Auckland, the Mediterranean fly has not been reared here except from maggots found in fruit imported from Sydney, none at all having been bred from "island" fruit. As this species thrives in comparatively cold climates, and attacks almost all kinds of fruit, we must carefully guard against its introduction.

When dealing with importations of fruit infested with different kinds of insects an Inspector must apply special methods for their destruction before delivering such fruit to importers. In the case of scale insects, which are exposed on the outside of the fruit, the whole consignment is subjected to the action of hydrocyanic-acid gas within an air-tight chamber for an hour. This treatment destroys the insects, but does not remove their scales or waxy coverings. The fly-maggots, on the other hand, cannot be destroyed by artificial means, unless by burning the fruit itself, as the maggot until mature or full-fed is secure within the fruit, there being only a minute hole through its skin formed by the ovipositor of the female fly whilst inserting her egg. When an Inspector detects the presence of these maggots in a case of fruit, all the other cases forming that particular consignment and branded with the same mark are soon afterwards burned in a furnace. As many as 450 cases belonging to one lot and consigned to one importer have been destroyed in that way, thereby causing a serious loss to the importer or shipper. The only exception to this rule applies to the islands of the Cook Group, recently annexed to New Zealand. In this instance only a consignment found to be infested with these maggots may be picked over under the Inspector's supervision. *Each fruit* is examined separately: if infested it is put aside for burning, but those found to be free from this pest are handed over to the importer, who therefore only loses the infected fruit.

During the year from 1st April, 1902, to the 31st March, 1903, there were ninety-one different lots, comprising 4,119 cases, of fruit condemned at Auckland alone on account of these maggots. All these consisted of "island" fruit.

The maggot of the new species (*Dacus xanthodes*) does not differ materially from those of the other flies specially alluded to.

It was discovered here in one pineapple imported from Rarotonga on the 5th December, 1903, and on the 14th of that month Mr. G. Harnett, Assistant Inspector, and I again detected it in two cases of pineapples from Suva. We also found it on various occasions afterwards in oranges, grenadillas, and mammæ-apples from Tonga and Rarotonga. The perfect flies were subsequently reared here from the maggots in considerable numbers, so that this new pest threatens to become as troublesome and injurious as the Queensland fly.

Dacus (Tephritis) xanthodes, sp. nov.

Imago.—Length of body, 4½ lines; expanse of wings, 7½ lines.

Body elongate, yellow, occasionally testaceous, extremity of abdomen blackish, head sometimes rufescent, tarsi infuscate; on the thorax, from base to apex, there is a central pale ivory-like streak, along each side there is a similar one; these lines after death become less conspicuous.

Head as broad as the thorax, smooth; on its back part there are four black outstanding setæ, and between the eyes six finer ones. *Antennæ* normal, their terminal joint elongate and rather darker than the others; at the tip of the preceding one arises a very long seta, which, though stout at its base, becomes very slender and darker towards the extremity. *Eyes* large, prominent, their inner edges straight and moderately distant from each other; they are finely facetted, and of a brilliant purple during life. *Thorax* cylindrical or subovate, nearly twice as long as it is broad, with two slight almost equidistant constrictions at each side; the surface bears numerous minute black granules, from each of these proceeds a fine dark hair; at the base, which is deeply emarginate, there are two long rigid conspicuous black setæ directed horizontally backwards, four smaller ones are situated just before the posterior constriction, and about an equal number along each side. *Hind-body* quite the length of the thorax, its basal three segments, irrespective of the narrowed anterior portion, of the same length and breadth, thus forming a cylindric figure, fourth segment rather shorter and narrowed behind, the terminal elongate and tapering towards its apex, with very fine grey hairs; the preceding segments are minutely sculptured and bear many dark slender hairs.

Legs stout, moderately elongate, with short black hairs; posterior tibiæ somewhat arcuate. Tarsi elongate, pilose, their basal joint rather more than half of their entire length, fifth bilobed; claws black and rather small.

Halteres yellow, medially slender, clavate and triangular at the extremity.

Wings hyaline, unspotted, with pale-brown nervures corresponding in structure with those of *Tephritis tryoni*.

Underside flavescent, not maculate, except at the apex of the last ventral segment, which is piceous. The abdominal segments are concave, or so deeply hollowed that the sides and upper surface appear quite thin.

Female.—Hind-body elongate-oval, terminal segment rounded nd not prolonged; on each side of the uncovered second segment there is a small cluster of fine black setæ: these do not occur in the other sex.

This species differs from Froggatt's *Tephritis psidii* in being larger, differently coloured and sculptured, and without dusky areas on the wings. From *T. tryoni* it is distinguished by the greater length of the body and expanse of wings, uniform coloration, without fuscous or yellow marks, dissimilar clothing and sculpture, less broadly oviform or wasp-like hind-body, and stouter antennal setæ. In *T. tryoni* the flanks of the sternum are fuscous.

Art. XXVIII.—*On some New Species of* Lepidoptera.

By Alfred Philpott.

Communicated by G. V. Hudson.

[*Read before the Wellington Philosophical Society, 2nd November,* 1904.]

Plate XX.

Melanchra decorata, n. sp. Plate XX., fig. 2.

♂, ♀, 38 mm. Head and palpi grey-yellowish. Antennæ simple in both sexes. Thorax with strong anterior bifid crest, less pronounced in ♀, grey-yellowish mixed with brown; patagiæ outwardly bordered with brown; a white line on collar followed by a black line. Abdomen with series of crests, grey-yellowish. Fore wings: Costa almost straight, termen slightly waved and faintly sinuate, *pale brownish-yellow* (in some examples tinged with pink) *mixed with whitish on basal half of costa*; a very dark reddish-brown shade from middle of base to termen above tornus, *bordered beneath from about* $\frac{1}{3}$ *by conspicuous white fascia which is bent sharply upwards at* $\frac{3}{4}$; a short brown streak from base below middle; orbicular oblique, faintly outlined in brown; reniform large, pale, outlined in brown; space between orbicular and reniform dark reddish-brown, connected with costa by narrow projection; two brown spots on costa above reniform; a faint double waved line from costa at $\frac{3}{4}$; subterminal indistinct, pale, waved, bordered with bright reddish-brown; veins faintly